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**REMARKS**

Claims 1-14 were pending in the present Application. Claim 6 has been canceled, Claim 1 has been amended, Claims 7-14 have been withdrawn, and Claim 15 has been added, leaving Claims 1-5 and 15 for consideration upon entry of the present Amendment.

Claim 1 was amended to include the features of Claim 6. Antecedent basis for newly added Claim 15 is found at least in paragraphs [0019] and [0024] as filed. No new matter has been introduced by these amendments.

Reconsideration and allowance of the claims are respectfully requested in view of the above amendments and the following remarks.

Before substantively addressing the merits of the rejection, it is noted that the Office Action relies upon German Patent No. DE 10061749 to Herbst-Dederichs. This reference is in the German language, not English. In responding to the rejections related to this reference, Applicants relied on a machine translation. In the event the above noted reference is relied upon in the next Office Action, Applicants request that the Examiner provide a translated document in pursuant to MPEP §706.02 Subsection II so that Applicants can better understand the teachings provided by the cited reference.

**Claim Rejections Under 35 U.S.C. § 102(b)**

Claims 1-5 stand rejected under 35 U.S.C. § 102(b), as allegedly anticipated by Herbst-Dederichs (hereinafter "Herbst-Dederichs") or U.S. Patent No. 4,925,626 to Anand et al (hereinafter "Anand"). Applicants respectfully traverse this rejection.

Claim 1 is directed to an erosion resistant coating comprising, *inter alia*, wherein the erosion resistant coating has a thickness greater than about 500 microns and is deposited with a high velocity air fuel process.

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To anticipate a claim, a reference must disclose each and every element of the claim. *Lewmar Marine v. Varient Inc.*, 3 U.S.P.Q.2d 1766 (Fed. Cir. 1987).

Claim 1 is not anticipated by Herbst-Dederichs or Anand since neither reference discloses erosion resistant coating has a thickness greater than about 500 microns and is deposited with a high velocity air fuel process. Applicants can find no such disclosure in either reference of a high velocity air fuel process or of an erosion resistant coating having a thickness greater than 500 microns.

Accordingly, the rejection of Claim 1 is requested to be withdrawn. Given that Claims 2-5 depend from and include all of the features of Claim 1, these claims are not anticipated too for at least the same reasons.

Claim Rejections Under 35 U.S.C. § 103(a)

Claim 6 stands rejected under 35 U.S.C. § 103(a), as allegedly unpatentable over Herbst-Dederichs or Anand. Applicants respectfully traverse this rejection.

Herbst-Dederichs is generally directed to wear resistant coatings for piston rings that comprise tungsten, carbon, chrome and either nickel or cobalt. The disclosed coating thickness is significantly less than 500 microns since it is directed to pistons. Moreover, Herbst-Dederichs it is believed (using a machine translation) that Herbst-Dederichs employs a high velocity oxygen fuel process for depositing the coating.

Anand is generally directed to a method for producing a tungsten-carbide/cobalt/chromium alloy coating comprising a hardness from about 870 to about 980 DPH and a roughness from about 190 to about 200 AA. There is no disclosure of a high velocity air process, which uses considerably less oxygen and a much lower temperature.

For an obviousness rejection to be proper, the Examiner must meet the burden of establishing a prima facie case of obviousness. *In re Fine*, 5 U.S.P.Q.2d 1596, 1598 (Fed. Cir.

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1988). Establishing a prima facie case of obviousness requires that all elements of the invention be disclosed in the prior art. *In Re Wilson*, 165 U.S.P.Q. 494, 496 (C.C.P.A. 1970).

A prima facie case of obviousness has not been established because the cited references fail to disclose a high velocity air fuel process or provide the claimed erosion resistant coatings at a thickness greater than 500 microns. For reasons discussed in Applicants application, the high velocity air fuel process permits the deposition of the claimed erosions resistant coatings having a thickness greater than 500 microns. In contrast, the maximum coating thickness for a high velocity oxygen fuel process is less than 500 microns.

The HVAF spraying process deposits an extremely dense (minimal porosity) and substantially non-oxidized coating. Moreover, increased thicknesses can be obtained relative to other thermal plasma spray processes, resulting in turbine components exhibiting superior erosion resistance properties. . . . In contrast HVOF thermal spray processes employ higher temperatures of about 1,500 to about 2,200°C, which deleteriously results in oxidation and deterioration of spray material upon deposition of the coating. Because of the oxidation as well as a buildup of residual stresses caused by the process, maximum coating thicknesses is at about 500 microns for the HVOF process.

(Applicants' specification, paragraph [0019])

Herbst-Dederichs teaches and suggests an HVOF process for providing an wear protection layers for piston rings employed in internal combustion engines. There is no disclosure of an HVAF process as claimed nor is there any disclosure of coatings having a thickness greater than 500 microns. Moreover, it is submitted that since Herbst-Dederichs is directed to coating pistons, there is no motivation to increase the thickness to greater than 500 microns. Still further, using the coating methods taught by the references, there is no expectation of success since coatings produced by HVOF would cracking and spalling at thicknesses greater than 500. For at least these reasons, Herbst-Dederichs fails to establish a prima facie case of obviousness and the rejection should be withdrawn.

Like, Herbst-Dederichs, Anand also fails to teach or suggest erosion resistant coatings produced by an HVAF process nor is there any disclosure or suggestion of coatings having a thickness greater than 500 microns. Anand, in its background section, teaches away from the

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use of any high velocity plasma spray process, nevermind HVAF for deposition of the coating.

For instance, it is widely accepted in the industry that Detonation gun (D-gun) deposits are significantly superior than the conventional and the high velocity plasma sprayed deposits for "hard coating".

(Anand, Col. 1, ll. 33-37)

In view of the foregoing, a case of prima facie obviousness is clearly not supported by this reference.


In view of the foregoing, the rejection of Claim 6 is requested to be withdrawn.

It is believed that the foregoing amendments and remarks fully comply with the Office Action and that the claims herein should now be allowable to Applicants. Accordingly, reconsideration and allowance are requested.

If there are any additional charges with respect to this Amendment or otherwise, please charge them to Deposit Account No. 06-1130.

Respectfully submitted,

CANTOR COLBURN LLP

By   
Peter R. Hagerty  
Registration No. 42,618

Date: February 8, 2006  
CANTOR COLBURN LLP  
55 Griffin Road South  
Bloomfield, CT 06002  
Telephone (860) 286-2929  
Facsimile (860) 286-0115  
Customer No.: 23413